Non-Functional Testing on Mobile Devices

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Outline

1. Introduction
2. Functional Requirements
3. Non-Functional Requirements
4. Non-Functional Testing: KPIs
5. Summary
Introduction

Nikolai Pavlov

- 2005-2007 Mobile QA Engineer / Skype
- 2007-2008 Technical PM in Mobile / Skype
- 2008-2011 Mobile QE Manager / Skype
- 2011-… Skype Mobile QE Lead / Microsoft
- 2007 TTU, Computer Systems, B.Sc.
- 2011 TU, IT management, MBA
Requirements

Functional vs. Non-functional

WHAT? vs. HOW?
Functional Requirements

- Use Case
  - Implementation
  - Testing
  - Synergy

- Functional Requirement
- Test Case

BUSINESS
Non-Functional Requirements

Non-Functional requirements categories:

- Performance
- Security
- Usability
- Localization
- Scalability
- etc....
Non-Functional Requirements

**Functional vs. Non-functional**

**Functional**
- User MUST be able to sign in
- User MUST be able to switch application between foreground and background

**Non-functional**
- Sign-in time should be equal or less than 5 seconds
- Maximum delay in toggling foreground / background is less than 1 second
Non-Functional Requirements

• What if we can’t meet the requirement?
• How far from meeting the requirement?
• Are we making the right changes?
• ...
Non-Functional Requirements: KPIs

1. WHAT?
2. HOW?
3. DATA
Non-Functional Requirements: KPIs

1. Application Size
2. Start-Up time
3. Responsiveness
4. Memory Footprint
5. Battery Life
Application Size: How?

Build x.y.z

- User Interface
- Graphic Assets
- Library
- Audio Library
- Video Library

Chart showing breakdown of application size over builds.
Application Size: Why?

1. Monitor
2. Debug
3. Optimize
Start-Up: Importance

1. Mobile Users are always in a hurry
2. Competitors
3. Customers
Start-Up: How?

1. Integrate into your automation tests
2. Use Test Frameworks
3. Use Record-Play
Responsiveness: Importance

1. Mobile Users are always in a hurry
2. Competitors
3. Customers
Responsiveness: How?

1. Integrate into your automation tests
2. Use Test Frameworks
3. Use Record-Play
Memory Footprint: How?

1. Define test suite
2. Define baseline
3. Manual – first, ultimate goal - automate
Memory Footprint: How?
Memory Footprint: How?

WP Performance Analysis tool

Device Status for Windows Phone

DDMS

android.os.Debug

xcode Instruments
Battery Consumption: Why?

• Provide visibility to battery consumption changes with every new integration
• Provide battery consumption data to main stakeholders and partners
• Provide battery consumption data for making decisions
Battery Consumption: How?

- Build Server
- Test Framework Server
- Test Library
- User Profiles
- Use Cases
- Test Cases
- Upload build instrumentation
- Programatically controled (on/off) USB ports
- Voltage control
- Results fetching
- DC Power Analyzer Mainframe:
  * In Power Supplies
  * Digital Voltmeter / Ammeter
  * Data Logger

Slide
Battery Consumption: How?

TEST PREPARATION
Prepare test:
* Download artifacts
* Download control scripts
* Download latest or defined build

DEVICE PREPARATION
Clean Install:
* Remove prev. client
* Install new client
* Upload new configuration files

ENVIRONMENT PREPARATION
* Initiate Skype client
* Turn Off USB
* Start Bots
* Start Test Script

TEST EXECUTION
* DATA collection
* Running for defined period of time
* Once per minute fetching logs
* Running Test Script

TEST COMPLETION
* Complete fetching logs
* Calculate average
* Upload artifacts to QuickBuild
* Report uploaded to DB
* Results uploaded to Confluence
Battery Consumption: How?
Questions